REMARKS

With this Amendment, Applicant adds new claim 8. Therefore, claims 1-8 are all the claims pending in the application.

I. Preliminary Matters

The Examiner has accepted the drawings filed on March 1, 2005. Additionally, the Examiner has acknowledged the claim to foreign priority and receipt of the certified copy of the priority document. The Examiner has also initialed the PTO/SB/08 forms submitted on March 1, 2005 and August 31, 2006, indicating that the listed references have been considered.

II. Claim Rejections - 35 U.S.C. § 103 - Claims 1, 2, and 7

Claims 1, 2 and 7 currently stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over the background of the Applicant's specification in view of Xiao ("A Novel MC-2D-CDMA Communication System and Its Detection Methods" 2000 IEEE International Conference on Communications, Publication Date: 2000 Volume: 3, Pages: 1223-1227). Applicant respectfully traverses this rejection.

Claim 1

Applicant submits that the combination of the background of the specification and Xiao would not teach the current invention recited in claim 1. It is only described in Xiao that Walsh codes on the frequency axis are multiplied by Walsh codes on the time axis, thereby realizing two-dimensional orthogonal codes. Claim 1, on the other hand, recites spreading codes that are used in communication so as to be orthogonal on the frequency and/or on the time axis. In this

manner, despreading codes can be adaptively assigned by considering fluctuation of propagation paths on the frequency axis and on the time axis, which is an advantage that the technique of Xiao cannot accomplish. Therefore, the combination of the background of the specification and Xiao would fail to teach all the elements of claim 1.

Further, the combination of the background of the specification and Xiao would fail at least because modifying the background of the specification with the teachings of Xiao would render system described in the background of the specification inoperable for its intended purpose. The background of the specification discloses a CDMA system and an MC-2D-CDMA system that use orthogonal spreading codes. This means that the codes are all orthogonal to each other and any combination of each other. So, a signal that is spread using any combination of codes will effectively be canceled out by a despreading code that is not within that combination, assuming that there is no noise or interference or channel fluctuation. Xiao does not operate in this manner.

Instead, Xiao generates a spreading code that includes two components, a_k and c_k, and these components are orthogonal to themselves. However, the total code is not orthogonal. For instance, the 2-bit WALSH codes are (1,1) and (1,-1). This would lead to spreading codes of (1,1,1,1) and (1,1,1,-1) for example. These codes are not orthogonal with each other. These codes would work properly in Xiao, but would not work in the systems disclosed in the background of the specification. The codes are not orthogonal, so the despreading signal in the MC-2D-CDMA system in the background of the specification would not cancel out the signal. As such, modifying the MC-2D-CDMA system of the specification with the teachings of Xiao

would render it inoperable for its intended purpose, and would require an extensive redesign to operate properly. Thus, it would not be obvious to modify the background of the specification with the teachings of Xiao to produce the current invention.

Additionally, Applicant submits that it would not be obvious to combine the background of the specification with Xiao at least because there is no motivation to do so. The Examiner asserts that it would be obvious to combine the background of the specification with Xiao in order to provide higher capacity. In the background of the specification, an MC-2D-CDMA system is already disclosed. In the system disclosed in the background, the Codes 1-4 that are used are orthogonal with each other, allowing an amount of users corresponding to the number of codes available. For instance, in the provided example, a 2x2 code is used, allowing for four codes. This means that the system could accommodate at least four users. (Specification, page 2, line 18 - page 4, line 19). Modifying the background of the specification with the teachings of Xiao would not allow higher capacity, as the use of orthogonality in Xiao does not increase the capacity of Xiao beyond what a conventional MC-2D-CDMA system would have. The system in Xiao still accommodates MxN users. Thus, a 2x2 system in Xiao would accommodate 4 users, just as a 2x2 system disclosed in the background of the specification would accommodate 4 users. The increase in capacity that Xiao speaks of is in reference to the combination of multicarrier and code division multiple access (CDMA) providing higher capacity than multicarrier modulation schemes such as OFDM. (Xiao, 2nd paragraph of page 1223). Higher capacity is not a valid reason for combining the references because Xiao would not actually provide higher capacity over the background of the specification.

The Examiner also asserts that it is well known that utilizing orthogonality reduces interference between signals. However, even assuming *arguendo* that it were well known that using orthogonality reduces interference between signals, it would not be sufficient to show that the current invention is obvious. Such a solution would fail to account for fluctuation on the frequency or time axis. The current invention as recited in claim 1, however, uses orthogonality in relation to the frequency and/or time axis to account for the fluctuation. As such, it is not orthogonality alone that defines the current invention, but the combination of using orthogonality and applying it to the frequency and/or time axis. The references do not provide a suggestion for modifying the background of the specification in this manner. Therefore, the only reason for modifying the background of the specification would be that it is well known to use orthogonality to reduce signal interference, which alone is not sufficient to render the current invention obvious. As such, the reasons the Examiner provided for combining the references are not adequate for at least the reasons discussed above.

For at least these reasons, Applicant submits that claim 1 is patentable over the cited references.

Claim 7

For analogous reasons to those discussed above, Applicant submits that claim 7 is patentable over the cited references.

Claim 2

Applicant submits that claim 2 is patentable at least by virtue of its dependency on claim 1.

III. Claim Rejections - 35 U.S.C. § 103 - Claims 3 and 4

Claims 3 and 4 currently stand rejected under 35 U.S.C. § 103 as allegedly unpatentable over the background of the Applicant's specification in view of Xiao ("A Novel MC-2D-CDMA Communication System and Its Detection Methods" 2000 IEEE International Conference on Communications, Publication Date: 2000 Volume: 3, Pages: 1223-1227), and further in view of Uesugi (U.S. Patent App. Pub. No. 2004/0042386). Applicant respectfully traverses this rejection.

Claim 3

Applicant submits that Uesugi fails to overcome the deficiencies of the background of the specification and Xiao. Therefore, claim 3 is patentable at least by virtue of its dependency on claim 1 and for these additional reasons.

In regards to claim 3, the Examiner has conceded that the background of the specification combined with Xiao fails to teach the means for detecting channel fluctuation and the code that assigns spreading codes that are orthogonal on only the frequency or time axis. However, the Examiner asserts that these features would be obvious if the combination is taken in view of Uesugi (U.S. Patent App. Pub. No. 2004/0042386). Applicant submits that claim 3 would not be obvious in view of the cited references.

The device of Uesugi involves modifying the spreading factors in each dimension of a two dimensional spreading code, yet keeping orthogonality between the codes. (Uesugi, paragraphs 54-55). The spreading factor is essentially the length of the spreading code. While Uesugi does monitor the channel fluctuation to determine the optimum spreading factor in the

time axis and the frequency axis, it would not make it obvious to use its monitoring function to modify the combination of the background of the specification and Xiao at least because it would be using the function of Uesugi for a purpose other than what it was intended for. Uesugi monitors the channel situation to determine optimum spreading factors, not to assign spreading codes that are orthogonal on a selected axis.

Further, it would not be obvious to incorporate a means for detecting channel fluctuation into Xiao along with assigning spreading codes based on the channel fluctuation. There is no suggestion in Xiao to assign codes based on channel fluctuation. Instead, Xiao operates by assigning WALSH codes to the M chips of the spreading code and also assigning WALSH codes to the N chips of the spreading code all the time.

For at least these reasons, Applicant submits that claim 3 is patentable over the cited references.

Claim 4

Applicant submits that Uesugi fails to overcome the deficiencies of the background fo the specification and Xiao. Therefore, claim 4 is patentable at least by virtue of its dependency.

IV. Claim Rejections - 35 U.S.C. § 103 - Claim 5

Claim 5 currently stands rejected under 35 U.S.C. 103 as allegedly unpatentable over the background of the Applicant's specification in view of Xiao ("A Novel MC-2D-CDMA Communication System and Its Detection Methods" 2000 IEEE International Conference on

Communications, Publication Date: 2000 Volume: 3, Pages: 1223-1227), and further in view of Sudo (U.S. Patent App. Pub. No. 2004/0071078).

Applicant submits that Sudo fails to overcome the deficiencies of the background of the specification, Xiao, and Uesugi. Therefore, claim 5 is patentable at least by virtue of its dependency.

V. Claim Rejections - 35 U.S.C. § 103 - Claim 6

Claim 6 currently stands rejected under 35 U.S.C. 103 as allegedly unpatentable over the background of the Applicant's specification in view of Xiao ("A Novel MC-2D-CDMA Communication System and Its Detection Methods" 2000 IEEE International Conference on Communications, Publication Date: 2000 Volume: 3, Pages: 1223-1227), and further in view of Sumasu (U.S. Patent Pub. No. 2004/0028007).

Applicant submits that Sumasu fails to overcome the deficiencies of the background of the specification, Xiao, and Uesugi. Therefore, claim 6 is patentable at least by virtue of its dependency.

VI. New Claims

Applicant has added new claim 8, and submits that it is patentable at least by virtue of its dependency on claim 1.

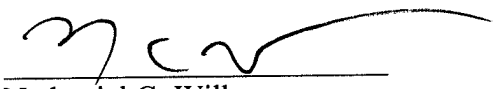
VII. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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Date: February 25, 2009